

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BOESCHENSTEIN, Edward A.
Polster, Lieder, Woodruff & Lucches
12412 Powerscourt Drive
Suite 200
St. Louis, MI 63131-3615
ETATS-UNIS D'AMERIQUE

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year)

09.11.2004

Applicant's or agent's file reference
TIMK 8429WO

IMPORTANT NOTIFICATION

International application No.
PCT/US 03/22135

International filing date (day/month/year)
16.07.2003

Priority date (day/month/year)
17.07.2002

Applicant
THE TIMKEN COMPANY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:



European Patent Office - P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl
Fax: +31 70 340 - 3016

Authorized Officer

Adam, G

Tel. +31 70 340-4133



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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TIMK 8429WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/22135	International filing date (<i>day/month/year</i>) 16.07.2003	Priority date (<i>day/month/year</i>) 17.07.2002
International Patent Classification (IPC) or both national classification and IPC G01P1/00		
Applicant THE TIMKEN COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 10.02.2004	Date of completion of this report 09.11.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Pflugfelder, G Telephone No. +31 70 340-2890 <div style="text-align: right;">  </div>

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/22135

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-9 as originally filed

Claims, Numbers

1-13 received on 30.09.2004 with letter of 30.09.2004

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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EXAMINATION REPORT**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-13
	No: Claims	
Inventive step (IS)	Yes: Claims	1-13
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US 03/22135

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: EP0694765 (MAGNETI MARELLI FRANCE) 31 January 1996 (1996-01-31)

D2: DE 100 34 844 A (DELPHI TECH INC) 12 April 2001 (2001-04-12)

The document D1 was not cited in the international search report. A copy of the document is appended hereto.

1. Novelty / Inventive step

The present application meets the criteria of novelty and inventive step Article 33(1),(2),(3) PCT.

1.1 The document D1 discloses (see figure 5; column 8, lines 2-4) (the references in parentheses applying to this document):

- a rotation sensor producing a signal reflecting the angular velocity of an adjacent rotating target;
- said sensor having a housing with a slot for receiving a mounting screw;
- the slot ("oeillet (732)") being formed from a deformable material ("bride (730) est venue de moulage... de matière thermoplastique").

D1 does not disclose the features of claim 1, that the slot is containing a

- permanent indentation receiving a portion of (the mounting) screw, said indentation being formed by the screw itself and being of a configuration that **prevents displacement of said slot along said screw** when said portion of the screw is in the indentation and,
- when the sensor is to be reinstalled in the same position, said portion of said screw is again **received** in said indentation.

The claim is thus novel.

The problem to be solved by the differing features can be seen as to provide a mounting structure allowing precise and easy reinstallation of the sensor after a

maintenance procedure.

The sensor of D1 being made of a soft material (e.g. a moulded polymer) may also be submitted to a similar technical effect, of creation of an indentation in its soft slot rim by the head of a mounting screw during the operations of its normal use (installation / dismounting / reinstallation). Such an effect would be immediately visible and could be used as a reference mark of the former installation position when the sensor would needed to be positioned at its old location. The mounting screw could then be introduced the at this very position of the indentation of the rim of the slot of the retainer ear.

The indentation in the slotted rim of D1 however would only be shallow, so that it would not provide the capability as an aid for (temporarily) holding the housing slot in a fixed position with regard to the screw as long as the screw is not completely turned down. The indentation and would therefore not have the same guiding function during mounting. Precise alignment of screw and eventual indentation of D1 would need additional care during mounting.

Particular structures in the slot for **receiving** a portion of the screw (such as the deformable slot rim (46) or the tapered side walls (62) of the slot (see figures 8,12 of the present application)) are not mentioned in D1.

Modification of the apparatus of D1 in order to come to the apparatus of claim 1 is therefore not considered to be obvious for the skilled person and the claim is considered to be inventive.

D2 (see column 5, line 29 - column 7, line 6; column 9, lines 5-30; figures) also does not show the above differing feature of the permanent deformation (of the rim of the slot) and needs serrated washers as additional structural elements in order to achieve the desired functions. Claim 1 is therefore also novel and inventive over D2.

1.2 Independent method claim 8 refers to a installation method for the sensor of claim 1 and provides the method features corresponding to the apparatus features of claim 1. The claim is therefore also novel and inventive.

1.3 Claims 2-7 as depending on novel and inventive apparatus claim 1 and claims 9-13 depending on novel and inventive method claim 8 are also novel and inventive.

**INTERNATIONAL PRELIMINARY
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International application No. PCT/US 03/22135

2. Industrial Applicability

The claimed invention meets the requirement of Article 33(4) PCT of industrial applicability.

3. Further remarks

3.1 The independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would have been appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

3.2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

3.3 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1,D2 is not mentioned in the description, nor are these documents identified therein.

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Claims

1. In combination with a mounting surface out of which a threaded hole opens and with a target which rotates in front of the surface about an axis that is oriented at a steep angle with respect to the surface, and with a screw having a threaded shank that threads into the hole and a head at the end of the shank;

a sensor for monitoring the rotation of the target; said sensor comprising:

- a housing located along the mounting surface and having a slot that is aligned with the threaded hole, the housing along the slot being formed from a deformable material and containing a permanent indentation that receives a portion of the screw, the indentation having been formed by the screw itself and being of a configuration that prevents displacement of the slot along the screw when the portion of the screw is in the indentation; and a sensing element located in the housing and being capable, in response to rotation of the target, of producing a signal that reflects the angular velocity of the target;

whereby the sensor, should it be removed from the mounting surface by withdrawing the screw from the threaded hole, may be reinstalled in the same position by again threading the screw into the hole such that the portion of it is received in the indentation.

2. The combination according to claim 1 wherein the housing has a front face; wherein the slot opens out of the front face; and wherein the deformable material forms a rim along the slot, with the rim projecting beyond the front face.

3. The combination according to claim 2 wherein the rim on the housing contains the indentation and the head of the screw is received in the indentation.

4. The combination according to claim 1 wherein the housing has a front face and a back face; wherein the slot opens out of both faces and has side walls which taper downwardly toward the back face so that the

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slot is wider at the front face than it is at the back face; and wherein the deformable material is located along the side walls of the slot.

5 5. The combination according to claim 4 wherein the indentation opens out of the tapered side walls of the slot and is configured to receive the shank of a screw.

10 6. The combination according claim 1 wherein the slot is one of two slots in the housing, and the slots are parallel; wherein the threaded hole is one of two holes that open out of the mounting surface; and wherein the screw is one of two screws, with each screw being in a different slot and threaded into a different hole.

15 7. The combination according to claim 1 wherein the housing includes a sacrificial rim which projects beyond the sensing element a prescribed distance to establish a known gap between the target and the sensing element.

20 8. A process for installing a speed sensor against a mounting surface out of which a threaded hole opens so that the speed sensor can monitor the rotation of a target that revolves in front of the mounting surface about an axis oriented at a steep angle with respect to the surface, the sensor including a housing having a slot and along the slot being formed from a deformable material, the sensor further including a sensing element located in the housing and being capable, in response to rotation of the target, of producing a signal that reflects the angular velocity of the target, said process comprising:

25 placing the housing of the sensor against the mounting surface with the slot in the housing aligned with the threaded hole that opens out of the mounting surface;

inserting a screw having a threaded shank and a head into the slot in the housing;

30 positioning the housing along the mounting surface with the correct gap between the sensing element and the target;

with a portion of the screw forming a permanent indentation in the housing along the slot, with the indentation being configured such that,

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when the portion of the screw that formed it is in the indentation, the housing cannot be displaced along the slot; and

threading the screw into the threaded hole.

9. The process according to claim 8 wherein the head of the
5 screw forms the indentation.

10. The process according to claim 8 wherein the housing has a front face; wherein the slot opens out of the front face; wherein the deformable material forms a rim along the slot, with the rim projecting beyond the front face, and wherein the head of the screw forms the
10 indentation in the rim.

11. The combination according to claim 8 wherein the shank of the screw forms the indentation.

12. The process according to claim 8 wherein the housing has a front face and a back face; wherein the slot opens out of both faces and has
15 side walls which taper downwardly toward the back face so that the slot is wider at the front face than it is at the back face; wherein the deformable material is located along the side walls of the slot, and wherein the shank of the screw forms the indentation in the side walls of the slot.

13. The process according to claim 8 and further comprising:
20 withdrawing the screw from the threaded hole;
removing the sensor from the mounting surface;
thereafter placing the sensor along the mounting surface with its slot aligned with the hole;

25 inserting the screw through the slot and threading it into the hole, with said portion of the screw being received in the indentation;

whereby the sensor assumes the same position along the mounting surface.

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